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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/848,256	05/04/2001	Kazuyuki Misumi	401188	6322

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EXAMINER	
THAI, LUAN C	
ART UNIT	PAPER NUMBER
2827	

DATE MAILED: 05/06/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/848,256	MISUMI ET AL.
	Examiner	Art Unit
	Luan Thai	2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *4-11 and 16-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *4-11 and 16-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

This Office action is responsive to the amendment filed February 26, 2002.

Claims **4-11 and 16-22** are pending in this application (claims 17-22 are newly added claims).

Claims **1-3 and 12-15** have been canceled.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims **16 and 21** are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The specification, as originally filed, does not disclose that each dummy lead extends across one of the longer sides of the semiconductor *chip to reach a position opposite the semiconductor chip*, as recited in claim 16, lines 12-13, and that *a part of the semiconductor chip contacting the surface of the semiconductor chip*, as recited in claim 21, lines 8-9.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims **16 and 21** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim **16**, the expression "each dummy lead extends across one of the longer sides of the semiconductor chip to reach a position opposite the semiconductor chip" is unclear as to which position on the chip is opposite to the chip.

In claim **21**, the expression "a part of the semiconductor chip contacting the surface of the semiconductor chip" is confused and not understood as how a part of a semiconductor chip can contact a surface of the semiconductor chip itself.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

6. Claims 4-6 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamamura et al. (5,334,803).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claims 4-6 and 9, Yamamura et al. disclose (specifically see figures 19 and 23-24) a sealed semiconductor device comprising: a semiconductor chip 2; a lead frame including internal leads 4 extending across part of and spaced from a surface of the chip, wherein at least one of the internal leads includes a protrusion protruding toward and contacting the surface of the semiconductor chip at a peripheral area of the chip, and wherein the protrusion is an end of at least one of the internal leads that includes a bend proximate the end.

7. Claims 10, 17, and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Tomita et al. (5,535,509).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claims 10, 17, and 19, Tomita et al. disclose (see specifically figures 21-25 and 29-30) a sealed semiconductor device (figures 1A-1B) comprising: a semiconductor chip 2; a lead frame including internal leads 3 extending across part of and spaced from a surface of the chip; a die pad 110 (figures 29-30) on which chip 2 is mounted, wherein the lead frame includes protrusions 111-112 extending substantially perpendicular to and contacting the die pad 110 (see figures 29-30) but not contact the semiconductor chip 2. Tomita et al. further disclose the die pad 110 being substantially rectangular (see figures 29-30) and the protrusions extending proximate a pair of shorter sides of the die pad 110.

8. Claim 11 is rejected under 35 U.S.C. 102(b) as being anticipated by Aoki (5,834,691).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claim 11, Aoki discloses (see specifically figures 1-7) a sealed semiconductor device comprising: a semiconductor chip 6; a lead frame 10 including internal leads 1 extending across part of and spaced from a surface of the chip (see figures 6a-6d); a die pad 3 on which chip 6 is mounted, wherein the die pad including fixed protrusions 4 extending toward and contacting some of internal leads.

9. Claims 20-22, insofar as in compliance with 35 USC 112, are rejected under 35 U.S.C. 102(b) as being anticipated by Lee (5,358,906).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claims 21-22, Lee discloses (see specifically figures 3-4-5) a sealed semiconductor device comprising: a semiconductor chip 31; a die pad 34a on which the chip is mounted; a lead frame 34 including internal leads 34b extending across part of and spaced from a surface of the chip and electrically connected to electrode pad 32 of the chip via wires 35; a tape member 33 having a first surface to which the internal leads are entirely bonded and fixed, and a second surface not fixed to but contacting the semiconductor chip, to ensure a

fixed distance between the chip and the internal leads; an encapsulating 36 sealed the semiconductor chip.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 7 and 16, insofar as in compliance with 35 USC 112, are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamura et al. (5,334,803).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claim 7, it appears from Yamamura et al.'s figure 20 that some of inner leads 4 are not electrically connected to the electrode pads 3 by wirings 5, and thus, it would be obvious for these inner leads to be considered as the claimed of "a dummy internal lead not connected by a wire to the chip".

Regarding claim 16, Yamamura et al. disclose (specifically see figures 19 and 23-24) a lead frame for a sealed semiconductor device comprising: a semiconductor chip 2 having a substantially rectangular shape with a pair of longer sides and a pair of shorter sides and sealed in an encapsulating resin, the lead frame comprising: internal leads 4 extending toward and electrically connected with wires 5 to respective pads 3 located approximately along a

central axis of the semiconductor chip 2; at least one internal lead in direct contact with a surface of the semiconductor chip to ensure a fixed separation between the semiconductor chip and the internal leads, wherein each internal leads extends across one of the longer sides of the semiconductor chip to the corresponding pad, and the at least one internal lead extends across one of the longer sides of the semiconductor chip to reach a position opposite the semiconductor chip. Yamamura et al. do not explicitly disclose the at least one internal lead contacting the surface of the chip being call dummy lead.

It appears from Yamamura et al.'s figure 20 that some of inner leads 4 are not electrically connected to the electrode pads 3, and thus, it would be obvious for these inner leads to be considered as the claimed of "a dummy internal lead". Further, the labels nonetheless are meaningless. The Yamamura et al.'s structure anticipates Applicant's claimed structure regardless of whether some of internal leads are labeled "dummy". See *In re Pearson* , 181 USPQ 642; Fx parte Minks 169 USPQ 120; or *In re* Swinehart 169 USPQ 226, all of which make it clear that mere "labels" or "statements of in intended use" as we have here in "dummy" do not distinguish over Yamamura et al.'s structure which may be likewise labeled.

12. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamura et al. (5,334,803) in view of Nakamura et al. (6,060,770).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claim 8, Yamamura et al. disclose(s) all the limitations of the claimed invention as detailed above except for the dummy internal lead extending toward the chip along and across one of the shorter pair of sides of the chip.

Nakamura et al. while related to a similar Lead-on-Chip design teach (see specifically figure 28) a rectangular shaped semiconductor chip 2 having dummy inner lead portions 5a extending toward the chip along and across one of the shorter pair of sides of the chip 2 (Col. 9, lines 16+). Thus, a dummy lead extending toward the chip along and across one of the shorter pair of sides of the chip is conventional in semiconductor art, specifically in semiconductor lead-on-chip art as taught by Nakamura et al. above. It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply Nakamura et al.'s teachings to Yamamura et al. device by forming a dummy lead extending toward the chip along and across one of the shorter pair of sides of the chip since such arrangement structure of dummy lead in a device package is conventional in the art as taught by Nakamura et al.

13. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tomita et al. (5,535,509) in view of Aoki (5,834,691).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claim 18, Tomita et al. disclose(s) all the limitations of the claimed invention as detailed above except for the protrusions extending proximate a pair of longer sides of the rectangular die pad. Note that Tomita et al. do disclose the protrusions extending proximate a pair of shorter sides of the rectangular die pad.

Aoki while related to a similar lead-on-chip with die pad structure design teaches (see specifically figures 25c-25d) the protrusions (S) extending proximate a pair of either shorter sides or longer sides of the rectangular die pad (D). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the die pad of Tomita et al.'s lead frame by forming the protrusions extending proximate a pair of longer sides of the rectangular die pad instead of extending proximate a pair of shorter sides of the rectangular die pad, since such structure is conventional in the art, as taught by Aoki, and the modification is held to be within a general skill of a worker in the art.

Conclusion

14. Applicant's arguments with respect to claims **4-11, 16** and newly added claims **17-22** have been fully considered, but they are deemed to be moot in view of the new grounds of rejection.

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action because the underlined portions of claims **4-11, 16** and newly added claims **17-22** raise new issues that would require further consideration and/or search. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luan Thai whose telephone number is (703) 308-1211. The examiner can normally be reached on 7:00 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Talbott can be reached on (703) 305-9883. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Luan Thai
April 30, 2002

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